i) removal of the hydrogen atom from the oxygen atom of a carboxylic acid, an alcohol or a polyol; or

ii) removal of the hydrogen atom from the sulfur atom of a mercaptan, mercaptoacid, mercaptoalcohol, mercaptoacid ester or mercaptoalcohol ester,

and where any oxygen present in said tin-containing stabilizer is bonded only to one or more of tin, carbon, phosphorus and hydrogen, the improvement which comprises replacing part of the tin-containing stabilizer with a mercaptoloweralkanol ester of a carboxylic acid containing 2 to 20 carbon atoms.

~~61~~ 60. A method according to claim 60 in which the mercaptoloweralkanol ester comprises a mercaptoloweralkanol ester of stearic acid, oleic acid, linoleic acid, myristic acid or palmitic acid.

~~62~~ 61. A method according to claim 60 in which the mercaptoloweralkanol ester comprises 2-mercaptoethyl stearate, 2-mercaptoethyl oleate or 2-mercaptoethyllinoleate.

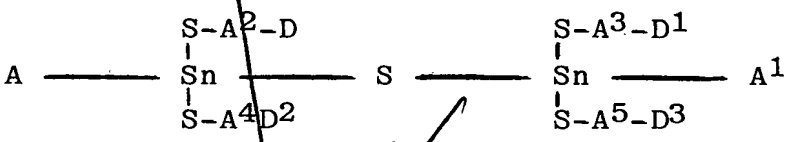
~~63~~ 62. A method according to claim 61 in which the tin-containing stabilizer comprises a mono- or diorganotin oxide, sulfide, carboxylate, mercaptide, derivative of a mercaptoacid, derivative of a mercaptoalcohol or their esters.

~~64~~ 63. A method according to claim 61 in which the tin-containing stabilizer comprises a compound selected from

dibutyltin maleate
dibutyltin di(stearyl maleate)
[monobutyltin(isooctylmercaptoacetate)-sulfide]

monobutyltin(dodecylmercaptide)sulfide
monobutyltin(mercaptoethyloleate)sulfide
monobutyltin trimercaptoethyloleate
monobutyltin (hydroxyethylmercaptide)(sulfide)

and bridged sulfur compounds of formula



where

A and A^1 are lower alkyl of 1 to 12 carbon atoms;
A^2, A^3, A^4 and A^5 are lower alkylene
D, D^1, D^2 and D^3 each independently, is

OH, $-OC(=O)-(C_8-C_{20}\ \text{alkyl})$,
(C_6-C_{18})alkyl, or where
D and D^1, or D^2 and D^3 together form the group

$$-OC(=O)-C_mH_{2m}-CO(=O)-$$

where m is a number from 0 to 8.

65. A method according to claim 61 in which the tin-containing stabilizer is present in an amount to provide up to about 0.25 parts of metal per 100 parts of polymer and the mercaptoloweralkanol ester is present in an amount up to about 6.5 parts per 100 parts of polymer.

66. A method for stabilizing a vinyl halide polmer against heat and light which comprises incorporating therein

a) a tin-containing stabilizer comprising a mono- or diorganotin oxide, sulfide, carboxylate, mercaptide, derivative of a mercaptoacid, derivative of a mercaptoalcohol, or their esters, and

b) a mercaptoloweralkanol ester of a carboxylic acid containing 2 to 20 carbon atoms,

there being present up to about 0.25 parts of tin per 100 parts of polymer and up to about 6.5 parts of mercaptoloweralkanol ester per 100 parts of polymer.

~~67~~ 64. A vinyl halide composition which has been stabilized with respect to heat and light by incorporating therein

a) a heat stabilizer comprising a mono- or diorgano- derivative of tetravalent tin where the remaining valences of the tin atom are satisfied by bonds to halogen, oxygen, phosphorus, sulfur and a residue resulting from

i) removal of the hydrogen atom from the oxygen atom of a carboxylic acid, an alcohol or a polyol; or

ii) removal of the hydrogen atom from the sulfur atom of a mercaptan, mercaptoacid, mercaptoalcohol, mercaptoacid ester or mercaptoalcohol ester,

and where any oxygen present is bonded only to one or more of tin, carbon, phosphorus and hydrogen,

and

b) a mercaptoloweralkanol ester of a carboxylic acid containing 2 to 20 carbon atoms,

there being present up to about 0.25 of tin per 100 parts of polymer and up to about 6.5 parts of mercaptoloweralkanol per 100 parts of polymer.

67

68. A composition according to claim 67 in which the mercaptoloweralkanol ester comprises a mercaptoloweralkanol ester of stearic acid, oleic acid, linoleic acid, myristic acid or palmitic acid.

68

69. A composition according to claim 67 in which the mercaptoloweralkanol ester comprises 2-mercaptoethyl stearate, 2-mercaptoethyl oleate or 2-mercaptoethyllinoleate.

69

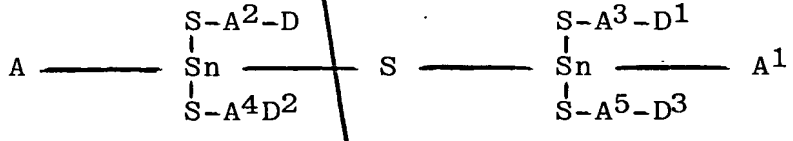
70. A composition according to claim 69 in which the tin-containing stabilizer comprises a mono- or diorganotin oxide, sulfide, carboxylate, mercaptide, derivative of a mercaptoacid, derivative of a mercaptoalcohol or their esters.

70

71. A composition according to claim 69 in which the tin-containing stabilizer comprises a compound selected from

dibutyltin maleate
dibutyltin di(stearyl maleate)
[monobutyltin(isooctylmercaptoacetate)-sulfide]
monobutyltin(dodecylmercaptide)sulfide
monobutyltin(mercaptoethyloleate)sulfide
monobutyltin trimercaptoethyloleate
monobutyltin (hydroxyethylmercaptide)(sulfide)

and bridged sulfur compounds of formula



where

A and A^1 are lower alkyl of 1 to 12 carbon atoms;
A^2, A^3, A^4 and A^5 are lower alkylene
D, D^1, D^2 and D^3 each independently, is

O
||
OH, -OC - (C_8 - C_{20} alkyl),
(C_6 - C_{18})alkyl, or where
D and D^1, or D^2 and D^3 together form the group

O O
|| ||
-OC - C_mH_{2m} - CO -

where m is a number from 0 to 8.

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STATUS OF THE CLAIMS

In the Office Action of June 16, 1982, the Examiner indicated that the sole remaining basis of rejection was obviousness in the sense of 35 USC 103; the Examiner rejected all claims as being obvious and therefore unpatentable over Stapfer et. al. taken with Weinberg, Kugele and Gough.

Claims 60-71 remain in the case.

REMARKS

Entry of the foregoing Amendment is respectfully requested on the basis that it places this case in condition for allowance or, alternatively, that it simplifies and reduces the issues and places this case in better condition for appeal.